

2020

**Washington State Ferry Terminal
Structural Inspection**

By the Bridge Preservation Office

Seattle Ferry Terminal

Location	Bridge No.	Type	Inspection Date	Report Received
Slip 3	519/100FT	Routine, FC, Special	6/23/2020	9/23/2020

FC = Fracture Critical



Electronic Version G:\Term_Fac_Info\Terminal\Inspections\Bridge_Reports*.pdf
Also on the DOT Bridge website at <http://beist/InventoryAndRepair/Inventory/BRIDGE>
Additional Information and Fracture Critical Report are in the Bridge Works Program

BRIDGE INSPECTION REPORT

Page 1 of 8

Status: Released

Printed On: 8/26/2020

Agency: State Ferries

CD Guid: f16afaab-5679-4020-bed7-0540a0cd8fdd

Release Date: 8/26/2020

Program Mgr: Tom E. Castor

Br. No. 519/100FT

SID 0007486B

Br. Name SEATTLE SLIP 3

Carrying FERRY TRAFFIC

Route On 00519

Mile Post 1.31

Intersecting PUGET SOUND @ SEATTLE

Route Under

Mile Post

Inspector's Signature CRT

Cert # G1325

Cert Exp Date 1/12/2022

Co-Inspector's Signature LAW

Inspections Performed

Report Type	Inspection Type	Date	Freq	Hours	Inspector	Cert No	Co-Insp.
Routine		6/23/2020	24	1.0	CRT	G1325	LAW
Fracture Critical		6/23/2020	24	1.0	CRT	G1325	LAW
Underwater		7/12/2017	60	5.0	JRWH	G0911	DRB
Special Feature	Ferry terminal	6/23/2020	24	1.0	CRT	G1325	LAW
Informational		5/28/2020			GCS	G0412	

8 <input type="checkbox"/> Alignment (1661)	38 <input type="checkbox"/> Operating Tons (1552)	N <input type="checkbox"/> Bridge Rails (1684)	0 <input type="checkbox"/> No Utilities (2675)
6 <input type="checkbox"/> Deck Overall (1663)	<input type="checkbox"/> Op RF (1553)	N <input type="checkbox"/> Transition (1685)	1.50 <input type="checkbox"/> Asphalt Depth (2610)
5 <input type="checkbox"/> Superstructure (1671)	23 <input type="checkbox"/> Inventory Tons (1555)	N <input type="checkbox"/> Guardrails (1686)	1964 <input type="checkbox"/> Year Built (1332)
5 <input type="checkbox"/> Substructure (1676)	<input type="checkbox"/> Inv RF (1556)	N <input type="checkbox"/> Terminals (1687)	0 <input type="checkbox"/> Year Rebuilt (1336)
9 <input type="checkbox"/> Culvert (1678)	5 <input type="checkbox"/> Operating Level (1660)	<input type="checkbox"/> Bridge Rail Ht (2612)	
8 <input type="checkbox"/> Chan/Protection (1677)	A <input type="checkbox"/> Open/Closed (1293)	<input type="checkbox"/> Design Curb Ht (2611)	
N <input type="checkbox"/> Pier/Abut/Prot (1679)	5 <input type="checkbox"/> Structural Eval (1657)		
8 <input type="checkbox"/> Waterway (1662)	8 <input type="checkbox"/> Deck Geometry (1658)		
3 <input type="checkbox"/> Scour (1680)	9 <input type="checkbox"/> Underclearance (1659)		

RECEIVED

SEP 23 2020

TERMINAL ENGINEERING

NBIS Risk Category

High Risk

Inspection Flags

<input type="checkbox"/> Soundings (2693)	<input type="checkbox"/> Measure Clearance (2694)	<input type="checkbox"/> Revise Rating (2688)	<input type="checkbox"/> Photos (2691)	<input type="checkbox"/> QA Flag (2695)
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BMS Elements

Element	Element Description	Total	Units	CS 1	CS 2	CS 3	CS 4
8128	Steel Submerged Pile/Column	26	EA	10	0	16	0
8132	Concrete Pier Cap/Crossbeam	32	LF	32	0	0	0
8201	Steel Open Girder, (FC)	180	LF	168	0	12	0
8206	Steel Floor Beam	240	LF	236	0	4	0
8209	Steel Stringer	450	LF	441	3	6	0
8219	Steel Grid Deck Concrete Filled	1800	SF	1800	0	0	0
8224	Thin Polymer Overlay < 0.5" Thick	1800	SF	1800	0	0	0
8225	Non-skid Metal Surfacing	330	SF	325	0	5	0
8301	Apron Steel Orthotropic Deck	330	SF	283	0	47	0
8305	Apron Hinge Multi-Pin & Plate	8	EA	4	0	4	0
8307	Apron Lips & Pins	12	EA	12	0	0	0
8310	Apron Hoist/Cables/Spool/Platform/Supports/Rigging	1	EA	1	0	0	0
8341	Lift Beam (FC)	34	LF	0	0	34	0

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BMS Elements (Continued)

Element	Element Description	Total	Units	CS 1	CS 2	CS 3	CS 4
8342	Live Load Hanger Bars (FC)	2	EA	2	0	0	0
8343	Apron Two Hinge Pin System/LL Hanger Pins (FC)	4	EA	2	0	2	0
8348	Span Hoist/Cables/Spool/Platform/Supports/Rigging	1	EA	1	0	0	0
8356	Steel Cracking	25	EA	0	0	25	0
8357	Pack Rust	8	EA	0	8	0	0
8361	Scour	2	EA	1	0	1	0
8362	Impact Damage	1	EA	1	0	0	0
8370	Seismic - Longitudinal Restrainer	2	EA	2	0	0	0
8390	Fixed Bearing	2	EA	2	0	0	0
8408	Steel Sliding Plate Joint	44	LF	44	0	0	0
8413	Steel Tower/Steel A Frame	2	EA	0	0	2	0
8415	Steel Headframe	192	LF	192	0	0	0
8417	Tower Base Platform	76	SF	76	0	0	0
8418	Counterweight Guides	8	EA	8	0	0	0
8419	Concrete Counterweights	4	EA	4	0	0	0
8420	CTWT Sheaves/Shfts(FC)/Bearings/Anchor Blts.	12	EA	12	0	0	0
8421	Counterweight Cable Protective Systems	320	LF	320	0	0	0
8451	Steel Pile Frame Wingwalls	56	LF	50	0	6	0
8464	Concrete Pontoon Floating Dolphin	90	LF	90	0	0	0
8704	Pontoon Anchors, Anchor Chain/Cables/Clamps	4	EA	4	0	0	0
8810	Metal Bridge Railing	28	LF	28	0	0	0
8901	Protective Coating - Bridge	8000	SF	6050	1000	950	0
8902	Protective Coating - Piling	13200	SF	13068	0	132	0
8907	Galvanizing	400	SF	160	130	110	0
8910	Safety Access Ladders	3	EA	1	0	2	0
8911	Safety Railing & Catwalks	120	LF	120	0	0	0

Notes

0 GENERAL NOTES:

For location reference: Ahead on stationing is going offshore and lateral features are called out left and right.
 Slip 3 limits start at the bridge seat and extend out to the wingwalls.
 See drawing "Colman Dock Layout 4 of 4" in the files tab.
 Full routine, Fracture Critical, and Special Inspections performed during even numbered years.
 Interim inspection is a 'safety' level inspection for verification of repair items, done in odd numbered years.

1 FRACTURE CRITICAL INSPECTION:

Fracture Critical (FC) Inspection required on even years.
 FC Inspection includes transfer span two girder system and ultrasonic testing of the upper live load hanger pins. Ultrasonic inspection is due in 2020.
 See attached FC Report File for results.

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Program Mgr: Tom E. Castor

Br. No. 519/100FT**SID** 0007486B**Br. Name** SEATTLE SLIP 3**Carrying** FERRY TRAFFIC**Route On** 00519**Mile Post** 1.31**Intersecting** PUGET SOUND @ SEATTLE**Route Under****Mile Post****Notes (Continued)**

9 The WSDOT Bridge Preservation Office Dive Team performed an underwater inspection of Seattle Slip 3 on July 12, 2017. The steel bridge seat, the concrete encased steel towers, the steel pile frame wing walls, the north floating dolphin, and the north anchor chains were submerged and included in this inspection. Echelon Engineering inspected all timber during their 2016 inspection so no timber was inspected during this inspection.

Overall the submerged portions of the structure are in fair condition. Marine growth up to 95% coverage was typical on all surfaces below high water. Bridge seat piling protective system has failed below water on Piles 6, 8, and 9. Pile 8 has large holes through it up to 7" wide in the bottom 4'. Tower concrete encased H-piles have up to 5' of steel piles exposed near the mudline. All the exposed steel H-piles below water have corrosion but only 4 piles had measurable section loss. The largest amount of section loss was in the Left Tower Pile 1A which was holed through with heavy knife edging of the flange. The wing wall piles have some bands of coating failure at mudline. This coating failure was mainly on the row 1 piles which are closest to the ferry boat and get the most propeller wash. Pile thickness readings were taken and 3 piles had measurable section loss. The anchor chains were in good condition. Anchors for Anchor Chains N1, N2, and N3 were found and in good condition. The N4 anchor chain became buried before reaching the anchor.

No repairs are required per the underwater inspection findings. Retaining the 60 - month underwater inspection frequency is recommended.

1671 SUPERSTRUCTURE:
Coded '5' due to longitudinal beam cracks in the apron. See Element 8301

1676 SUBSTRUCTURE:
Coded '5' due to heavy corrosion on the H-piles. See Element 8128.

1679 PIER PROTECTION:
WB73-86 Navigation Control Code is '0' - Navigation permit does not exist. Therefore, 679 on the NBI tab is coded 'N'.

1680 SCOUR:
A scour code of 3 (calculated scour critical) is used programmatically for all WSF slips (bridge seats and tower piles).

8128 STEEL SUBMERGED PILE/COLUMN:
Wingwall piling are discussed under the wingwalls.

Tower H-piles are concrete encased from the cap down.
The inboard pile sets of 3 piles are encased in a common tapered shroud that looks like a pier wall for the top 12 ft. (Photo #142). The right concrete encased Pile RT3-A1 has section loss of the flanges; the offshore measures 5/16" and the onshore measures 7/16" (Photo #75). It also has large cracks open up to 3/16" by 27" long (Photo #134).
There is visible section loss, laminar rust, in the webs and flanges of all the piles, where they are exposed below the tower base platform (16 piles in CS3).

Bridge seat piling replaced prior to 2020 inspection (10 new piles) (Photo #143).

Underwater Inspection Findings:

Tower H-piles have up to 5' of steel piles exposed near the mudline. All the exposed steel H-pile below water have corrosion but only 4 piles had measurable section loss. The largest amount of section loss was in the Left Tower Pile 1A which was holed through with heavy knife edging of the flange (Photo UW-1).

Underwater inspection previously found section loss to bridge seat piling. Piling at bridge seat has been replaced since the 2017 Underwater Inspection.

See attached "Pile Inspection Data" for individual pile conditions.

8132 CONCRETE PEIR CAP/CROSSBEAM:
A few hairline cracks at the pile interface to cap soffit.

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Right girder has 2 holes each 3/8" diameter x 1/4" deep pitting the top flange 5 ft offshore of the lift beam (CS3).
 Left and right girder offshore ends have areas of failed paint and pitting, approximately 5% section loss in the bottom flange, 10 ft. each side of the lift beam (CS3)--REPAIR #10002.
 Right girder has been hit at the shore end, noted first in 2016. Prior to 2020 inspection, stiffening plates were welded in as part of slip move (Photo #137)(CS3).
 Left girder also has minor impact damage at the shore end near deck level with similar stiffening plate as well (Photo #138).

8206 STEEL FLOORBEAM:

Floorbeam 0 right side has a 1-1/2" stepped web crack that is end rusted (Photo #129)(CS3).
 Floorbeam 0 left side has a 2-1/4" stepped web cope crack (Photo #107)(CS3).
 Floorbeam 1 right side has a 1/4" cope crack (Photo #130)(CS3).
 Floorbeam 1 left side has a 1/2" diagonal crack (Photo #89)(CS3).
 Monitor REPAIR #10001.

The bottom flange of the floorbeams and lateral gussets have section loss in places leaving 10% section loss in localized areas.
 Paint failing with laminar rust starting at Floorbeam 7 off shore side of the bottom flange and increasing offshore (Photo #120)--REPAIR #10002.

8209 STEEL STRINGER:

Stringer 5C has a 1" bend in the bottom flange.
 Stringers 8A, 8C, and 8D have replaced bolts at the offshore ends (CS2).
 Stringers 9A, 9B, 9C, 9D, and 9E were replaced (CS1).
 Stringers in bay 8 that have not been replaced have failed and paint and laminar rust in the top flange connection to the deck (CS3)--REPAIR #10002.

8219 STEEL GRID DECK CONCRETE FILLED:

Concrete curb ends are cracked and spalled with rebar exposed and painted over.
 Right hand top side of curb has a 9" spall with three rebars exposed at the shore end, and a spall with three rebars exposed at the offshore end.
 The steel pan soffit has surface rust with loss of most paint between Floorbeam 7 and offshore end (Photo #120)--REPAIR #10002.

8224 THIN POLYMER OVERLAY LESS THAN 0.5" THICK:

Transfer span has a MMC overlay which has light wear (Photo #117).
 There are 4" diameter shallow depressions in the overlay in the inside wheel line of each lane.

8225 NON-SKID METAL SURFACING:

Approximately 5 sf. of surfacing is worn off the apron in the wheel lines (Photo #135).

8301 APRON STEEL ORTHOTROPIC DECK (including Apron Longitudinal Beams):

Plate is worn and gouged.
 Apron Longitudinal Beams:
 There are 21 longitudinal beams in the apron (Photo #122), numbered from left to right (1 to 21). There are 12 transverse straps numbered from onshore to offshore (1 to 12). There are defects in the longitudinal beams where they frame into the onshore floorbeam, with most having undercut welds to a maximum of 1/8" deep. In addition, beam bottom flanges are cracked and have surface rust at this weld location, with some cracks extending full width of the bottom flange (Photos #74, #86 and #87)--REPAIR #10003.

8305 APRON HINGE MULTI-PIN & PLATE

4 of the 8 pins have elongated holes (CS3). Nuts held on with cotter pins (Photo #121).
 Paint has failed with thin layer of laminar rust typical at each hinge--REPAIR #10002.

8341 LIFT BEAM (FC):

Lift beam paint has failed exposing the steel to the salt water, corrosion has increased since the 2014 inspection (Photos #119 and #124)--REPAIR #10002.
 The bottom flange of the lift beam has 10% section loss in bottom flange and webs with heavy laminar rust (Photo #124).
 The bottom cover plate has 4" stitch welds at 1.5 ft. O.C., welds have surface corrosion and slag inclusions (CS3).

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Underwater Inspection Findings:

Heavy marine growth was typical on all surfaces below high water. A level II cleaning and inspection of the live load hanger bars stops found that they were in place and in good condition.

8343 APRON TWO HINGE PIN SYSTEM/LL HANGER PINS:

The upper and lower live load hanger pins are visual inspected during each inspection, upper pins are ultrasonically tested every 72 months, done in 2020.

Lower pins cannot be UT'd due to design and are visually inspected. Lower pins have wear grooves as noted in the attached file "Seattle Slip 3 FC Workbook" (Photos #131 and #132)(CS3)--REPAIR #10004.

8356 STEEL CRACKING:

There are 4 locations with cracks in the floorbeam copes (CS3), see element note 8206.

There are 21 locations with cracks in the apron steel orthotropic deck (CS3), see element note 8301.

8357 PACK RUST:

Towers have several places with 1/4" thick pack rust, see element note 8413.

8361 SCOUR:

Scour is evaluated as part of the underwater inspection and thorough annual soundings performed by WSF.

Underwater Inspection Findings:

Scour due to propeller is the most likely cause for the H-pile exposure of the concrete encased H-piles of the towers. This exposure has not changed significantly since the previous underwater inspection.

8362 IMPACT DAMAGE:

Shore ends of left and right girder return flange are bent from traffic damage, see note 8201.

8408 STEEL SLIDING PLATE JOINT:

Joint cover plate at the bridge seat and at the apron connection to the transfer span has some wear.

The apron hinge cover plate has non-skid coating worn off in the wheel lines.

8413 STEEL TOWER:

Left tower lower strut is bent up 1-3/4" at midpoint and the right tower lower strut is bent up 2-1/2" and buckled at midpoint. Both are bent from the lift beam coming in contact with the tower (Photos #109 and #112)(CS3)--REPAIR #4.

Some areas of failed paint and surface rust due to damage--REPAIR #10002.

Both lift towers have pack rust, 1/4" thick, at the mid height gusset plates (Photos #90 and #91).

8417 TOWER BASE PLATFORM:

Some leaching noted on foundation caps with moderate to heavy leaching on offshore side of left tower base.

8419 CONCRETE COUNTERWEIGHTS:

Apron counterweights were replaced prior to the 2020 inspection (Photo #136).

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Notes (Continued)

8451 STEEL PILE FRAME WINGWALLS:

RIGHT WINGWALL:

Two steel waler ends on the right wingwall outboard have been damaged by impact. These walers are located in the 4th and 5th tier down. The waler webs are buckled/bent 3" out of plane and the flanges are twisted out of plane over the end 3 feet (Photo #105)(CS3).

Several facing timbers are rotten, with lower portion missing from two of them (Photo #139)(CS3).

LEFT WINGWALL:

Lower trelex fender between pile walls is loose (Photo #133).

Underwater Inspection Findings:

Overall the submerged portions of the steel piles of the wingwalls were in satisfactory condition. Heavy marine growth was typical on all surfaces below high water. Level II cleanings were done as required and the coating on most piles was found to be in good condition. Some of the piles had bands of coating failure at mudline (Photo UW-4). This coating failure was mainly on the row 1 piles which are closest to the ferry boat and get the most propeller wash. Pile thickness were taken and 3 piles had measurable section loss with the deepest pits being 0.375" deep in RWW Pile 2B in localized areas.

See attached "Pile Inspection Data" for individual pile conditions.

8464 CONCRETE PONTOON FLOATING DOLPHIN:

Quantity reflects the north half rubbing faces of the north floating dolphin.

Underwater Inspection Findings:

Heavy marine growth was typical on all surfaces below high water. Concrete was in good condition with no structural defects noted.

8704 PONTOON ANCHORS, ANCHOR CHAIN/CABLES/CLAMPS:

Anchors N1 through N4 are considered part of Slip 3.

Underwater Inspection Findings:

Heavy marine growth was typical on all surfaces below high water. All sinker blocks were attached and hanging well above the bottom at the time of this inspection. The anchors for N1 and the common anchor for N2 and N3 were found and appear to working well (Photos UW-5 and UW-6). The anchor chain for N4 became buried before the anchor was reached.

See attached "Anchor Chain Inspection Data Sheet" for details on individual chains.

See attached "Floating Dolphin Layout" for locations.

8901 PROTECTIVE COATING - BRIDGE:

Towers, Headframe, and Girders were painted with urethane paint in 2004.

Some areas of paint failure in the towers--REPAIR #10002.

Offshore end of girders, starting 10 feet shore side of the liftbeam have paint failure and laminar rust.

Girder webs and top flanges have thin and chalky paint.

Floor system, Apron, and Floorbeams were painted with epoxy paint in 2004, paint is beginning to fail starting at Floorbeam 7 and going offshore--REPAIR #10002.

The paint has been scraped off under the apron.

8902 PROTECTIVE COATING - PILING:

Protective system on the steel pile framed wingwalls piles and the bridge seat piles are included in this element.

Piles have scattered small areas of rust blistering at and above the ITZ.

Underwater Inspection Findings:

Heavy marine growth was typical on all surfaces below high water. The coating below the intertidal zone to the mudline was found to be 99% intact on most of the wing wall piles. See element 8451 for details. The coating on the bridge seat pile is failing in areas. See element 8128 for details.

8907 GALVANIZING:

Galvanized surfaces of cable end and clevises and various chain and cable fittings are galvanized. The galvanizing is in fair to poor condition. Several U-bolts on the wingwalls have heavily corroded threads and nuts. Galvanizing on items above the water is in good condition. Galvanizing on cables and fittings that drape into the splash zone is moderately to badly corroded.

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8910 SAFETY ACCESS LADDERS:

There is an access ladder on the right tower and 1 on each wingwall.

Wingwall ladders have deteriorated paint and are heavily rusted in the intertidal zone (Photo #140) (CS3).

Repairs

Repair No	Pr	R	Repair Descriptions	BMS	Noted	Maint	Verified
4	2	B	Steel Tower: Repair buckled braces on both towers.	8413	7/1/1992		
11	1	B	Replace rotten (RT) Piling, Walers and Rubbing Face Timbers in the timber Dogleg wingwalls and dolphin. Refer to Pile Inspection Data sheets and Drawing layouts for specific locations. 2020 - Timber wingwalls have been removed. Element deleted and repair verified out.		9/20/2006		6/23/2020
10001	M	B	Monitor cope cracks at Floorbeam 0 and Floorbeam 1. 2020 - CRT - No change in previously noted crack lengths.	8206	6/9/2010		
10002	1	B	Clean to bright steel, prime and paint areas of failed paint and rust in the floorbeams, girders, deck soffit, apron and towers. 2020 - added maintenance override date as work has not been done.	8201, 8206, 8209, 8219, 8305, 8341, 8413, 8901	6/9/2014	5/8/2020	
10003	M	B	Repair cracks in Apron Longitudinal Beams where they are welded to the shore end transverse beam. Cracks are present in all bottom flange locations, but do not currently extend up into webs. DRB 1/30/19. Changed repair to a MONITOR per WSF request. Change to a P1 repair if cracking extends in to the web of the apron longitudinal beam. See attached e-mail dated 1/30/19.	8301	6/2/2015		
10004	M	B	Replace the lower live load pins, which have wear grooves around 1/4" deep from contact with the live load hangers. DRB 1/30/19. Changed repair to a MONITOR per WSF request. Change to a P1 repair when wear groove reaches 1/2". See attached e-mail dated 1/30/19.	8343	6/25/2018		

Inspections Performed and Resources Required

Report Type	Date	Freq	Hrs	Insp	CertNo	Coinsp	Note	
Routine	6/23/2020	24	1.0	CRT	G1325	LAW		
Resources	Hours	Min	Pref	Max	Freq Date	Need Date	Override	Notes
Boat	1.00	K	K	K				Boat needed for routine, fracture critical, and special feature inspections. Use Kvichak or boat provided by WSF for inspection. Launch boat at Don Armeni Ramp.
Scheduling Restrictions								Inspections must be done without interfering with Ferry landings and departures.
Third Party Notification								Inspections may be done with Washington State Ferries Terminal Engineering Personnel. Contact Tom Castor 206-515-3727.
Tides								Tides affect the timing of the inspection. High tide needed for transfer span inspection.
Fracture Critical	6/23/2020	24	1.0	CRT	G1325	LAW		
Resources	Hours	Min	Pref	Max	Freq Date	Need Date	Override	Notes
Special Equipment	1.00	UT	UT	UT				Upper live load pins are ultrasonically tested every 72 months, done in 2020.
Underwater	7/12/2017	60	5.0	JRWH	G0911	DRB		

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Mile Post

Special Feature	6/23/2020	24	1.0	CRT	G1325	LAW	See attached Special Features Inspection Procedures for details.
Informational	5/28/2020			GCS	G0412		Generated by Repair List Managed Operation



Bridge Name: Seattle Slip 3
Bridge No: 519/100FT
Structure ID: 0007486B
Structure Type: SG
Agency: WSF
Milepost: 1.31

Date: 6/23/2020
Hours: 1.0
Inspector ID #: G1325
Lead Inspector Initials: CRT
Co-Inspector Initials: LAW

Lead Inspector Signature:

Co-Inspector Signature:

Inspected Items:

Procedures:

Welded Two Girder

1. Check longitudinal welds the full length of the FCM.
2. Check transverse connections into the FCM.
3. Check transverse welds on tension flanges and web areas.
4. Check terminus of all cover plates.
5. Check welds at connections.
6. Check backup bars, if present. Record presence of backup bars regardless of condition.
7. Check for cracks at any intersecting fillet welds.
8. Check longitudinal stiffener butt welds and adjacent webs.
9. For continuous spans with welded stud shear connectors, check top flange soffit for cracking in tension areas and document location in weld category C.
10. Check haunched areas of girders.
11. Check for welding arc strikes.
12. Check for any plug, tack, or repair welds. Record location of these welds and document weld type and category.
13. Check FC members and associated connection or gusset plates for areas of heavy or pitted corrosion, nicks, gouges, sharp bends, and collision damage. Record location and estimated section loss, if applicable.
14. Check all heat straightened or repaired areas. Record location of these areas, regardless of condition.

Pins and Anchor Bolts

1. As required, use mirrors or other equipment to check inside surfaces of FCM's.
2. Check for pitting, laminar rust, surface deformation, and pack rust. It is important to check the pin, pin nuts, and all members surrounding the pin for this kind of steel deterioration.
3. Check for mobility and noise of pin and surrounding members. If the pin is physically "frozen" it is important to note this because the added stress can affect other members in the structure.
4. Observe and record abnormalities like; alignment, pin wear, loose pin nuts, and amount of nut engagement. It's important to note that full nut engagement is when the nut is flush with the pin or the pin is extending past the nut.
5. Check for paint system failure on pin nuts, pin, and surrounding members.

FCM Location	FCM Type	FCM Per Girder or Truss Line	'Beist' Server Plans		
			Sh. No.	Contr.	Sh. Name
Main Span	Steel Welded Girder	1	T1	N/A	Trans. Elev.
			T2	N/A	Long. Elev.

Note: FCM = Fracture Critical Member



VISUAL FRACTURE CRITICAL
INSPECTION REPORT

Bridge Name:	Seattle Slip 3	Date:	6/23/2020
Bridge No.:	519/100FT	Hours:	1.0
Structure ID:	0007486B	Inspector ID #:	G1325
Structure Type:	SG	Lead Inspector:	CRT
Agency:	WSF	Co-Inspector:	LAW
Milepost:	1.31		

Truss / Girder	Span	Location	Feature Inspected	Detail Description	Remarks
Left	1	Girder	Welds	Flange, Web, and Stiffeners in Tension	Offshore end as areas of failed paint and pitting, approximately 95% section remaining in the bottom flange, 10 ft. each side of the lift beam. Minor impact damage on the shore end (Photo #138).
Left	2	Lift Beam	Pin	Bottom LL Hanger Pin	Wear groove in pin from hanger, approximately 1/4" deep (Photos #131 and #132)(CS3)--REPAIR #10004.
Left	2	Tower	Pin	Top Live Load Hanger Pin	No Visual Defects Noted
Left	2	Tower	Hanger	Live Load Hanger Link	No Defect Noted
Right	1	Girder	Welds	Flange, Web and Stiffeners in Tension	Impact damage on the shore end (Photo #137). Has 2 holes each 3/8" diameter x 1/4" deep pitting the top flange 5 ft. offshore of the lift beam.
Right	1	Lift Beam	Pin	Bottom LL Hanger Pin	Offshore end as areas of failed paint and pitting, approximately 95% section remaining in the bottom flange, 10 ft. each side of the lift beam. Wear groove in pin from hanger, approximately 1/4" deep (Photos #131 and #132)(CS3)--REPAIR #10004.
Right	2	Tower	Pin	Top Live Load Hanger Pin	No Visual Defects Noted
Right	2	Tower	Hanger	Live Load Hanger Link	No Defect Noted
Center	2	Lift Beam	Welds	Flange, Web and Stiffeners in Tension	The bottom flange of the lift beam has 90% of the section remaining due to laminar rust in areas of failed paint. The bottom cover plate has 4" stitch welds at 1.5 ft. O.C., welds have surface corrosion and slag inclusions.



Bridge Name: Seattle Slip 3
Bridge No: 519/100FT
Structure ID: 0007486B
Structure Type: SG
Agency: WSF
Milepost: 1.31

Date: 6/23/2020
Hours: 1.0
Inspector ID #: G1325
Lead Inspector's Initials: CRT
Co-Inspector Initials: LAW

Inspected items: Pins

Procedures:

Pins

1. When possible, test from both ends of pins.
2. Verify pin length shown on back reflection with plans. If back reflection does not match the plans, conduct manual length measurement and document correct pin length.
3. Start test with transducer at or near pin center for back reflection check, then run transducer around full perimeter of pin, searching for indications or significant loss of back reflection.
4. Whenever the test suggests that there is a defect in a pin, store and print out the indication with all associated equipment and settings documented. The location of the transducer shall also be documented using a clock hand convention (1 O'clock to 12 O'clock).

UTM Location	UTM Type	UTM Per Girder or Truss Line	'Beist' Server Plans		
			Sh. No.	Contract	Sh. Name
Main Span Towers	Shouldered Pins	1			
	Lower Pins	1			

Note: UTM = Ultrasonic Tested Member

CS1: Pins and associated connection plates that are in good condition. There may be minor rust or shallow surface deformations on the exposed pin surfaces. Minor amounts of rust powder or paint damage may be present suggesting minor pin rotation in place. No pack rust is present between associated connection plates. There is no noise associated with the pin connection. Apron and Live Load pins are effectively inspected by visual means. When UT is possible, it can be used as a vehicle to downgrade a pin due to indications. Pins that cannot be U.T'd because of geometry can still be in CS1.

CS2: Pins and associated connection plates that have throw mechanism repairs. Number of hinge pins that have plate repairs, replaced keeper bars or cotter pins. Ultrasonic Testing: Pins with indications less than 10% of the far shoulder reflection height.

CS3: Pins and associated connection plates have defects that may affect the strength or serviceability of the bridge. Significant corrosion may be present, suggesting that pins are frozen in place. Significant abnormalities may be observed in alignment, pin wear, or deck joint movement. Pack rust may be present between connection plates that place a jacking force between the plates and pin nuts. The connection may have significant amounts of rust powder and/ or make noise under loading. Pins that can be UT inspected have indications between 10 and 30 percent of the far shoulder reflection height.

CS4: Pins and associated connection plates have defects that are judged to affect the strength or serviceability of the bridge. There are frozen pins designed for free rotation as part of normal bridge movement. Pack rust is present between connection plates that is causing distortion/displacement of plates or pins. Pins that can be UT inspected have indications greater than 30 percent of the far shoulder reflection height. Pin replacement is required.



Bridge Name:	Seattle Slip 3	Date:	6/23/2020
Bridge No.:	519/100FT	Hours:	1.0
Structure ID:	0007486B	Inspector ID #:	G1325
Structure Type:	SG	Lead Inspector:	CRT
Agency:	WSF	Co-Inspector:	LAW
Milepost:	1.31		

Truss / Girder	Span	Location	Detail Description	Condition State (Worst case of VT or UT)							
				2010	2012	2014	2016	2018	2020	2022	2024
Left	2	Tower	Upper LL Hanger Pin	2	2	2	1	1	1		
Left	2	Lift	Lower LL Hanger Pin	2	2	2	1	3	3		
Right	2	Tower	Upper LL Hanger Pin	2	2	2	1	1	1		
Right	2	Lift	Lower LL Hanger Pin	2	2	2	1	3	3		

Updated pin definitions starting in 2015 allow for Pins that can only be accessed from one side to be CS1

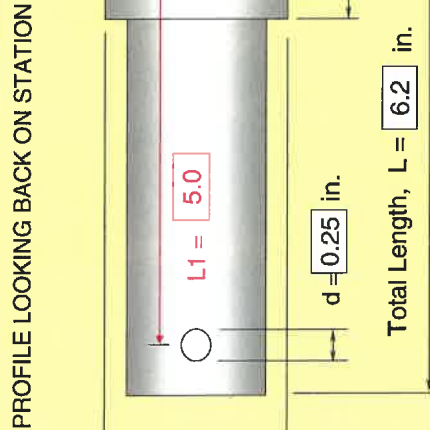


Washington State Department of Transportation

PIN'S INSPECTION SCHEDULE

Bridge Name:	Seattle Slip 3	Date:	6/23/2020
Bridge No.:	519/100FT	Hours:	1.0
Structure ID:	0007486B	Inspector ID #:	G1325
Structure Type:	SG	Lead Inspector:	CRT
Agency:	WSF	Co-Inspector:	LAW
Milepost:	1.31		

Truss / Girder	Span	Location	Detail Description	Redundant	Condition State		Freq. (Months)	UT Inspection Date (YEAR)	Next Inspection Date (YEAR)
					VT	UT			
Left	2	Tower Frame	Upper LL Hanger Pin	no	1	1	72	2020	2026
Left	2	Lift Beam	Lower LL Hanger Pin	no	3	N/A	N/A	N/A	N/A
Right	2	Tower Frame	Upper LL Hanger Pin	no	1	1	72	2020	2026
Right	2	Lift Beam	Lower LL Hanger Pin	no	3	N/A	N/A	N/A	N/A
Updated pin definitions starting in 2015 allow for Pins that can only be accessed from one side to be CS1 Due to pin geometry and design, lower pins are only visually inspected, UT does not return usefull results.									



STRUCTURE I.D.	0007486A
TRUSS or GIRDER	Live Load Hanger Pin
PIN I.D.	Upper Right

June 23, 2020

<<<<<<< LEFT END >>>>>>>

RIGHT END

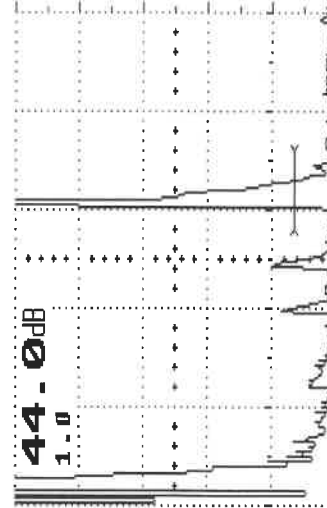
COMMENTS:

Cotter pin shows up at 3:00 O'clock shot with the gain off the charts. No indications noted other than cotter pin.

WASHINGTON STATE DEPARTMENT OF TRANSPORTATION BRIDGE PRESERVATION
BRIDGE NO.: SEATTLE SLIP
BRIDGE NAME: 519/101FT
LEAD INSPECTOR: JOHN LABRANCHE
CO-INSPECTOR: PHILIP KELLY
UT MODEL: KK USN 22
TRANSDUCER USED: 0.75" X 2.25" MHZ
TRANSDUCER MODEL: KK AEROTECH
INSPECTOR NO.: 0009013A
DATE: 6/7/2010

DR GAIN	.....	44.00in
DM RANGE	.....	10.00in
SV MTLVEL	.....	*28.81in/ms
DD D-DELAY	.....	*0.00in
PD P-DELAY	.....	0.029us
PD BSTART	.....	10%
2T BTRSH	.....	30%
VS S-DISP	.....	off
FFI FILLED	.....	off
UN UNIT	.....	inch
CM COMMOD	.....	padding
PC PREFEED	.....	padding

dB-STEP	1.	50
ALOGIC	pos	
ASPART	5.640in	
AWIDTH	1.671in	
ATRSH	13%	
CONTR	50	
LIGHT	off	
CRANKER	Epson	
DIALOG	English	
LENGTH	8	
PRINT	14%	



44.0 dB
1.0

SET-# 72
RECALL of f
STORE of f
DELETE of f

BASE P/R H=> S=5.984 10.00 MEM CFG

WSBIS Field Inventory Report



Approved	
Revised	
RFC	
AAN	
Not Reviewed	

1001		2009		2132		1019		1021		2023		1166		1188		1198	
Structure ID		Bridge Number		Bridge Name		Owner		County		City		Location		Latitude		Longitude	
0007486B		519/100FT		SEATTLE SLIP 3		22		17		1140		W END MARION ST		47° 36' 10.40"		122° 20' 21.90"	

1232		1236		1274		1286		1288		1289	
Feature Intersected		Facilities Carried		Region		Custodian		Parallel		Temporary	
PUGET SOUND @ SEATTLE		FERRY TRAFFIC		NW		22		N			

Shaded fields are to be reviewed each inspection.

Fields in *italics* are for information only & are not editable.

1332		1335		1340		1348		1352		1356		1364		1367		1370		1374		1382		1386		1397		1310		1312		1291	
Year Built		Year		Bridge Length		Screening Length		Lanes		Curb to Curb Deck Width		Sidewalk Left		Sidewalk Right		Min Vert Over Deck		Min Vert Under		Lat Code		Navigation Control Code		Approach Roadway		Skew Angle		Flared Angle		Median	
1964		0		105				2		20.0		0.0		0.0		16' 00"		00' 00"		N		0		22		0		N		0	

Layout WB73

2000		1432		1433		1434		1435		2440		1445		1451		2402		1487		1490		1354		1481		1495		1499		2500		2501		2502		1413	
Q Main Code		Q Main Code		Hwy Class		Service Level		Route Number		Milepost		ADT		Truck %		Crossing Description		Funct. Class		Lane Use Direction		Total Lanes Under		Horizontal Clearance Route Dir		Horizontal Clearance Reverse Dir		Max Vert Clearance Route		Max Vert Clearance Reverse		Min Vert Clearance Route		Min Vert Clearance Reverse		Delour Length	
M 1		3		1				00519		1.31		12000		1		SEATTLE SLIP 3		14		4		0		20' 00"				16' 02"		16' 00"						0	

Crossing Route On WB74

2000		1432		1433		1434		1435		2440		1445		1451		2402		1487		1490		1354		1481		1495		1499		2500		2501		2502		1413	
Q Main Code		Q Main Code		Hwy Class		Service Level		Route Number		Milepost		ADT		Truck %		Crossing Description		Funct. Class		Lane Use Direction		Total Lanes Under		Horizontal Clearance Route Dir		Horizontal Clearance Reverse Dir		Max Vert Clearance Route		Max Vert Clearance Reverse		Min Vert Clearance Route		Min Vert Clearance Reverse		Delour Length	

Crossing Route Under WB74

1532		1533		1535		1536		1538		1541		1544		1545		1547		1548		1551		1552		1553		1554		1555		1558	
Main Span Material		Main Span Material		Appr Span Material		Appr Span Design		Number Main Spans		Number Appr Spans		Service On		Service Under		Wearing Surface		Deck Type		Oper Rating Method		Oper Rating Tons		Oper Rating Factor		Inv Rating Method		Inv Rating Tons		Inv Rating Factor	
3		15		0		00		1		0		1		5		4		5		1		38				1		23			

Design WB75

2920		1890		2646		2648		2654	
Inspection		Date		Inspector		Cert No		Co-Inspector	
Route		6/23/2020		CRT		G1325		LAW	
Fracture Critical		6/23/2020		CRT		G1325		LAW	
Special Feature		6/23/2020		CRT		G1325		LAW	
Underwater									
UW Interim									

Inspection Report Types

NBIS Risk Category	
High Risk	

Printed Date	
9/22/2020	

Inspection		Date		Inspector		Cert No		Co-Inspector	
Condition									
Short Span									
Geometric									
Info		5/28/2020		GCS		G0412			
Inventory									

BRIDGE INSPECTION REPORT

Page 1 of 20

Status: Released

Printed On: 9/22/2020

Agency: State Ferries

CD Guid: f16afaab-5679-4020-bed7-0540a0cd8fdd

Release Date: 8/26/2020

Program Mgr: Tom E. Castor

Br. No. 519/100FT

SID 0007486B

Br. Name SEATTLE SLIP 3

Carrying FERRY TRAFFIC

Route On 00519

Mile Post 1.31

Intersecting PUGET SOUND @ SEATTLE

Route Under

Mile Post

SI-141

0 Orientation

Photo Type: D - Deck

Orientation: Sea

Date: 5/28/2020

Repairs:

Deck looking seaward.



SI-144

0 Orientation

Photo Type: E - Elevation

Orientation: Right

Date: 5/28/2020

Repairs:

Elevation looking right.



BRIDGE INSPECTION REPORT

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Route On 00519

Mile Post 1.31

Intersecting PUGET SOUND @ SEATTLE

Route Under

Mile Post

SI-142

8128 Steel Submerged Pile-Column

Photo Type: G - General

Orientation: Sea

Date: 5/28/2020

Repairs:

Concrete encasement of Tower Steel H-piling. Lower part of piles have separate round encasements.



SI-75

8128 Steel Submerged Pile-Column

Photo Type: G - General

Orientation: N

Date: 10/3/2008

Repairs:

Heavy corrosion, laminar rust, of concrete encased Pile RT3-A1. Others are similar.



BRIDGE INSPECTION REPORT

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Br. Name SEATTLE SLIP 3

Route On 00519
Route Under

Mile Post 1.31
Mile Post

SI-134

8128 Steel Submerged Pile-Column

Photo Type: G - General

Orientation: Right

Date: 6/25/2018

Repairs:

Concrete encasement at Pile RT3-A1 bearing is cracking at top offshore flange.



SI-143

8128 Steel Submerged Pile-Column

Photo Type: G - General

Orientation: Shore

Date: 5/28/2020

Repairs:

New bridge seat in 2020.



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Route On 00519

Mile Post 1.31

Intersecting PUGET SOUND @ SEATTLE

Route Under

Mile Post

UW-1

8128 Steel Submerged Pile-Column

Photo Type: I - In Depth

Orientation: Left

Date: 7/10/2017

Repairs:

4" diameter hole in Left Tower Pile 1A at MDL +1.



SI-137

8201 Steel Open Girder, (FC)

Photo Type: R - Repair

Orientation: Right

Date: 5/28/2020

Repairs: 10002

Right Girder, shore end with traffic impact. Note the rusty steel plates, added as part of dock construction work.



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Br. Name SEATTLE SLIP 3

Carrying FERRY TRAFFIC

Route On 00519

Mile Post 1.31

Intersecting PUGET SOUND @ SEATTLE

Route Under

Mile Post

SI-138

8201 Steel Open Girder, (FC)

Photo Type: R - Repair

Orientation: Left

Date: 5/28/2020

Repairs: 10002

Left Girder, shore end showing construction related retrofit block.



SI-129

8206 Steel Floor Beam

Photo Type: M - Monitor

Orientation: Sea

Date: 6/25/2018

Repairs: 10001

Floorbeam 0 right end 1-1/2" cope crack.



BRIDGE INSPECTION REPORT

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Carrying FERRY TRAFFIC
Intersecting PUGET SOUND @ SEATTLE

SID 0007486B

Br. Name SEATTLE SLIP 3

Route On 00519

Mile Post 1.31

Route Under

Mile Post

SI-107

8206 Steel Floor Beam
Photo Type: M - Monitor
Orientation: Shore
Date: 6/9/2011
Repairs: 10001
Floorbeam 0 has a 2-1/4" crack on the left end.



SI-130

8206 Steel Floor Beam
Photo Type: M - Monitor
Orientation: Sea
Date: 6/25/2018
Repairs: 10001
Floorbeam 1 right end has a 1/4" cope crack.



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Program Mgr: Tom E. Castor

Br. No. 519/100FT

SID 0007486B

Br. Name SEATTLE SLIP 3

Carrying FERRY TRAFFIC

Route On 00519

Mile Post 1.31

Intersecting PUGET SOUND @ SEATTLE

Route Under

Mile Post

SI-89

8206 Steel Floor Beam

Photo Type: M - Monitor

Orientation: W

Date: 6/14/2010

Repairs: 10001

Floorbeam 1 has a 1/2" diagonal crack on the left side.



SI-120

8206 Steel Floor Beam

Photo Type: R - Repair

Orientation: UP

Date: 6/9/2014

Repairs: 10002

Floorbeam 8 failed paint and laminar rust on bottom flange, inshore floorbeams in good condition.



BRIDGE INSPECTION REPORT

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Carrying FERRY TRAFFIC

Route On 00519

Mile Post 1.31

Intersecting PUGET SOUND @ SEATTLE

Route Under

Mile Post

SI-117

8224 Thin Polymer Overlay - 0.5- Thick

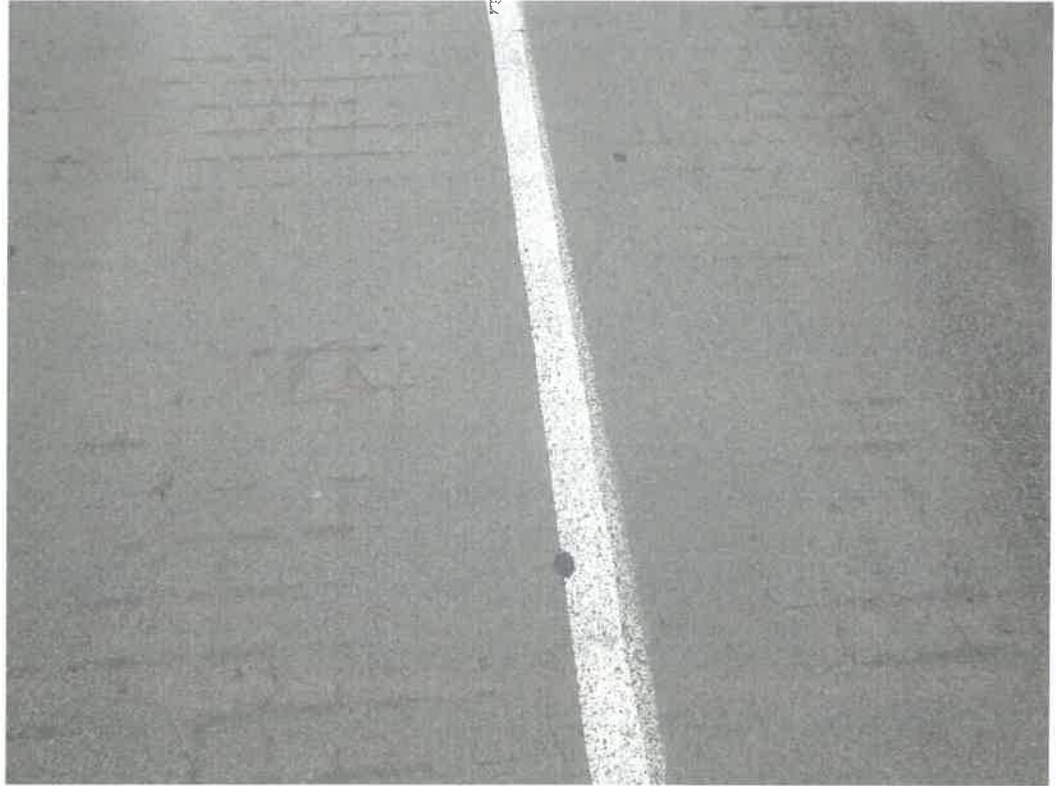
Photo Type: G - General

Orientation: DN

Date: 6/9/2014

Repairs:

MMC overlay is thinning in wheel lines.



SI-135

8225 Non-skid Metal Surfacing

Photo Type: G - General

Orientation: Sea

Date: 6/25/2018

Repairs:

Surfacing worn off in the wheel lines on the apron.



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Release Date: 8/26/2020

Program Mgr: Tom E. Castor

Br. No. 519/100FT

SID 0007486B

Br. Name SEATTLE SLIP 3

Carrying FERRY TRAFFIC

Route On 00519

Mile Post 1.31

Intersecting PUGET SOUND @ SEATTLE

Route Under

Mile Post

SI-122

8301 Apron Steel Orthotropic Deck

Photo Type: M - Monitor

Orientation: UP

Date: 6/9/2014

Repairs: 10002

Deteriorated paint on underside of apron.



SI-74

8301 Apron Steel Orthotropic Deck

Photo Type: R - Repair

Orientation: UP

Date: 10/3/2008

Repairs: 10003

Apron channel section cracked and corroding at onshore end.



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Program Mgr: Tom E. Castor

Br. No. 519/100FT

SID 0007486B

Br. Name SEATTLE SLIP 3

Carrying FERRY TRAFFIC

Route On 00519

Mile Post 1.31

Intersecting PUGET SOUND @ SEATTLE

Route Under

Mile Post

SI-86

8301 Apron Steel Orthotropic Deck

Photo Type: R - Repair

Orientation: UP

Date: 6/17/2009

Repairs: 10003

Apron Longitudinal Beam #9 with a heavy groove with 3/4" long crack in the bottom flange.



SI-87

8301 Apron Steel Orthotropic Deck

Photo Type: R - Repair

Orientation: UP

Date: 6/17/2009

Repairs: 10003

Overview photo of Apron Longitudinal Beam 9 where it frames into the shore transverse beam.



BRIDGE INSPECTION REPORT

Page 11 of 20

Status: Released

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Br. Name SEATTLE SLIP 3

Carrying FERRY TRAFFIC

Route On 00519

Mile Post 1.31

Intersecting PUGET SOUND @ SEATTLE

Route Under

Mile Post

SI-121

8305 Apron Hinge Multi-Pin & Plate

Photo Type: R - Repair

Orientation: UP

Date: 6/9/2014

Repairs: 10002

Apron Hinges, typical condition of failed paint and laminar rust.



SI-119

8341 Lift Beam (FC)

Photo Type: R - Repair

Orientation: Sea

Date: 6/9/2014

Repairs: 10002

Typical end paint condition of lift beam (right side shown).



BRIDGE INSPECTION REPORT

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Status: Released

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Program Mgr: Tom E. Castor

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Br. Name SEATTLE SLIP 3

Carrying FERRY TRAFFIC

Route On 00519

Mile Post 1.31

Intersecting PUGET SOUND @ SEATTLE

Route Under

Mile Post

SI-124

8341 Lift Beam (FC)

Photo Type: R - Repair

Orientation: Left

Date: 6/9/2016

Repairs: 10002

Laminar rust on lift beam. Bottom flanges and webs have 10% section loss.



SI-131

8343 Apron Two Hinge Pin System/LL
Hanger Pins (FC)

Photo Type: R - Repair

Orientation: DN

Date: 6/25/2018

Repairs: 10004

Overview of lower live load pin in hanger bar. Lower side of lower pins has a wear groove from the hanger.



BRIDGE INSPECTION REPORT

Page 13 of 20

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Release Date: 8/26/2020

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SID 0007486B

Br. Name SEATTLE SLIP 3

Carrying FERRY TRAFFIC

Route On 00519

Mile Post 1.31

Intersecting PUGET SOUND @ SEATTLE

Route Under

Mile Post

SI-132

8343 Apron Two Hinge Pin System/LL
Hanger Pins (FC)

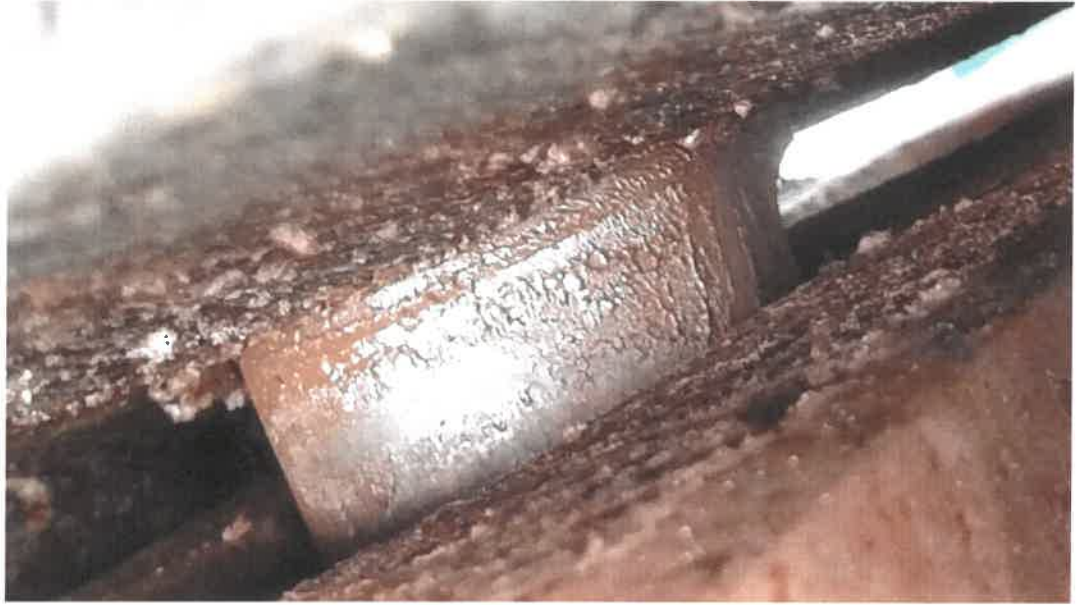
Photo Type: R - Repair

Orientation: DN

Date: 6/25/2018

Repairs: 10004

Closeup of lower live load pin showing
wear groove. Typical in each lower pin.



SI-109

8413 Steel Tower

Photo Type: R - Repair

Orientation: Left

Date: 6/9/2011

Repairs: 4, 10002

Bent strut on the left tower. Bent up
1=3/4" inch. Bend from raising transfer
span too high and the lift beam impacting
tower brace.



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Release Date: 8/26/2020

Program Mgr: Tom E. Castor

Br. No. 519/100FT

SID 0007486B

Br. Name SEATTLE SLIP 3

Carrying FERRY TRAFFIC

Route On 00519

Mile Post 1.31

Intersecting PUGET SOUND @ SEATTLE

Route Under

Mile Post

SI-112

8413 Steel Tower

Photo Type: R - Repair

Orientation: Right

Date: 6/9/2011

Repairs: 4, 10002

Right tower bent strut 2-1/2" over full width.



SI-90

8413 Steel Tower

Photo Type: G - General

Orientation:

Date: 6/14/2010

Repairs:

Pack rust in tower gusset plates due to lack of stitch bolts.



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SI-91

8413 Steel Tower

Photo Type: G - General

Orientation:

Date: 6/14/2010

Repairs:

Pack rust in tower gusset plates due to lack of stitch bolts.



SI-136

8419 Concrete Counterweights

Photo Type: G - General

Orientation: Sea

Date: 5/28/2020

Repairs:

Right side counterweights, left side are similar.



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SI-105

8451 Steel Pile Frame Wingwalls

Photo Type: G - General

Orientation: Left

Date: 6/9/2011

Repairs:

Outboard end of right wingwall has bent and crippled walers at level 4 & 5 down.



SI-139

8451 Steel Pile Frame Wingwalls

Photo Type: G - General

Orientation: Right

Date: 5/28/2020

Repairs:

Rotten facing timbers in right wingwall.



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Route On 00519

Mile Post 1.31

Route Under

Mile Post

SI-133

8451 Steel Pile Frame Wingwalls
Photo Type: G - General
Orientation: Sea
Date: 6/25/2018
Repairs:
Loose trellex fender in the left wingwall.



UW-4

8451 Steel Pile Frame Wingwalls
Photo Type: I - In Depth
Orientation: Sea
Date: 7/10/2017
Repairs:
Left Wing Wall Pile 1D has a 2' band of coating failure with corrosion.



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Br. Name SEATTLE SLIP 3

Route On 00519
Route Under

Mile Post 1.31
Mile Post

UW-5

8704 Pontoon Anchors, Anchor
Chain/Cables/Clamps

Photo Type: G - General

Orientation: Right

Date: 7/10/2017

Repairs:

N1 Anchor sticking out of mud with
anchor chain going around 4 H-beams.



UW-6

8704 Pontoon Anchors, Anchor
Chain/Cables/Clamps

Photo Type: G - General

Orientation: Shore

Date: 7/10/2017

Repairs:

The shared N2 - N3 anchor.



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Br. Name SEATTLE SLIP 3

Carrying FERRY TRAFFIC

Route On 00519

Mile Post 1.31

Intersecting PUGET SOUND @ SEATTLE

Route Under

Mile Post

SI-140

8910 Safety Access Ladders

Photo Type: G - General

Orientation: Left

Date: 5/28/2020

Repairs:

Left wingwall ladder rungs have section
lose from corrosion, right wingwall ladder
is similar.



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Carrying FERRY TRAFFIC

Route On 00519

Mile Post 1.31

Intersecting PUGET SOUND @ SEATTLE

Route Under

Mile Post

Entry Name	Folder Name	Type	Repairs	Page
SI-141	0 Orientation	D		1
SI-144	0 Orientation	E		1
SI-142	8128 Steel Submerged Pile-Column	G		2
SI-75	8128 Steel Submerged Pile-Column	G		2
SI-134	8128 Steel Submerged Pile-Column	G		3
SI-143	8128 Steel Submerged Pile-Column	G		3
UW-1	8128 Steel Submerged Pile-Column	I		4
SI-137	8201 Steel Open Girder, (FC)	R	10002	4
SI-138	8201 Steel Open Girder, (FC)	R	10002	5
SI-129	8206 Steel Floor Beam	M	10001	5
SI-107	8206 Steel Floor Beam	M	10001	6
SI-130	8206 Steel Floor Beam	M	10001	6
SI-89	8206 Steel Floor Beam	M	10001	7
SI-120	8206 Steel Floor Beam	R	10002	7
SI-117	8224 Thin Polymer Overlay - 0.5- Thick	G		8
SI-135	8225 Non-skid Metal Surfacing	G		8
SI-122	8301 Apron Steel Orthotropic Deck	M	10002	9
SI-74	8301 Apron Steel Orthotropic Deck	R	10003	9
SI-86	8301 Apron Steel Orthotropic Deck	R	10003	10
SI-87	8301 Apron Steel Orthotropic Deck	R	10003	10
SI-121	8305 Apron Hinge Multi-Pin & Plate	R	10002	11
SI-119	8341 Lift Beam (FC)	R	10002	11
SI-124	8341 Lift Beam (FC)	R	10002	12
SI-131	8343 Apron Two Hinge Pin System/LL Hanger Pins (FC)	R	10004	12
SI-132	8343 Apron Two Hinge Pin System/LL Hanger Pins (FC)	R	10004	13
SI-109	8413 Steel Tower	R	4, 10002	13
SI-112	8413 Steel Tower	R	4, 10002	14
SI-90	8413 Steel Tower	G		14
SI-91	8413 Steel Tower	G		15
SI-136	8419 Concrete Counterweights	G		15
SI-105	8451 Steel Pile Frame Wingwalls	G		16
SI-139	8451 Steel Pile Frame Wingwalls	G		16
SI-133	8451 Steel Pile Frame Wingwalls	G		17
UW-4	8451 Steel Pile Frame Wingwalls	I		17
UW-5	8704 Pontoon Anchors, Anchor Chain/Cables/Clamps	G		18
UW-6	8704 Pontoon Anchors, Anchor Chain/Cables/Clamps	G		18
SI-140	8910 Safety Access Ladders	G		19



Underwater Routine		7/12/2017 6/23/2020	Lead: JRWH Lead: CRT	Co: DRB Co: LAW		
Pile Location		Condition/Damage				
Bent	Pile	Pile Type	Details Location	Mudline Elevation (MLLW)	Details/Remarks	Inspection Type
PILE INSPECTION DATA - Bridge Seat (New for 2020 inspection)						
BS	1Br	Steel			No coating failure noted	Routine
BS	2Br	Steel			No coating failure noted	Routine
BS	3Br	Steel			No coating failure noted	Routine
BS	4Br	Steel			No coating failure noted	Routine
BS	5Br	Steel			No coating failure noted	Routine
BS	6Br	Steel			No coating failure noted	Routine
BS	7Br	Steel			No coating failure noted	Routine
BS	8Br	Steel			No coating failure noted	Routine
BS	9	Steel			No coating failure noted	Routine
BS	10	Steel			No coating failure noted	Routine
PILE INSPECTION DATA - Transfer Span Towers						
General: All piles have laminar rust with section loss in gap between end of encasement and bottom of cap.						
LT	1A	Concrete Encased H-piles	-42 MDL +1	-46.0	Bottom of concrete encasement. H-beam is holed through (4" diameter) with heavy knife edging which has reduced the width by 1"	Routine
LT	1B	Concrete Encased H-piles	-43 MDL	-46.0	Bottom of concrete encasement. H-beam has localized necking down to 3/16" flange thickness.	UW
LT	1C	Concrete Encased H-piles	-42	-45.0	Bottom of concrete encasement	UW
LT	1D	Concrete Encased H-piles	-37	-41.0	Bottom of concrete encasement	UW
LT	2A	Concrete Encased H-piles	-32 -44	-47.0	1.5 foot tall void in concrete exposing the H-beam over 50% of the pile. Bottom of concrete encasement	UW
LT	2B	Concrete Encased H-piles	-42 MDL +1	-47.0	Bottom of concrete encasement Slight flange necking down	UW
LT	2C	Concrete Encased H-piles	-44	-46.0	Bottom of concrete encasement	UW



Underwater Routine		7/12/2017 6/23/2020	Lead: JRWH Lead: CRT				Co: DRB Co: LAW
Pile Location			Condition/Damage				Inspection Type
Bent	Pile	Pile Type	Details Location	Mudline Elevation (MLLW)	Details/Remarks	Routine/UW	
LT	2D	Concrete Encased H-piles	-40	-43.0	Bottom of concrete encasement	UW	
RT	1A	Concrete Encased H-piles	-42	-45.0	Bottom of concrete encasement	UW	
RT	1B	Concrete Encased H-piles	-42	-45.0	Bottom of concrete encasement	UW	
RT	1C	Concrete Encased H-piles	-41	-44.0	Bottom of concrete encasement	UW	
RT	1D	Concrete Encased H-piles	-39	-40.0	Bottom of concrete encasement	UW	
RT	2A	Concrete Encased H-piles	-44 MDL +1	-47.0	Bottom of concrete encasement localized flange necking down to 5/16"	UW	
RT	2B	Concrete Encased H-piles	-43	-45.0	Bottom of concrete encasement	UW	
RT	2C	Concrete Encased H-piles	-44	-46.0	Bottom of concrete encasement	UW	
RT	2D	Concrete Encased H-piles	MDL	-43.5	Concrete encasement full height	UW	
PILE INSPECTION DATA - Wingwalls							
LWW	1B	Steel	MDL	-50.0	1' band of coating failure with 0.125" pittings. Good measurement 1.000" (2017)	UW	
LWW	1C	Steel	MDL	-50.0	1.5' band of coating failure.	UW	
LWW	1D	Steel	MDL	-50.0	2' band of coating failure.	UW	
LWW	2A	Steel	ITZ - MDL MDL	-48.0	99% coating intact 0.760" (2017)	Routine	
LWW	2B	Steel	ITZ - MDL	-47.0	99% coating intact	Routine	
LWW	2C	Steel	MDL	-47.0	6" band of coating failure on the slip side.	UW	
LWW	2D	Steel	ITZ - MDL	-46.0	99% coating intact	Routine	



Underwater		7/12/2017		Lead: JRWH		Co: DRB	
Routine		6/23/2020		Lead: CRT		Co: LAW	
Pile Location		Condition/Damage					
Bent	Pile	Pile Type	Details Location	Mudline Elevation (MLLW)	Details/Remarks	Inspection Type	
LWW	2E	Steel	ITZ - MDL		99% coating intact	Routine/UW	
LWW	2F	Steel	ITZ - MDL	-47.0	99% coating intact	Routine	
LWW	3B	Steel	ITZ - MDL	-39.0	99% coating intact	Routine	
LWW	3C	Steel	ITZ - MDL	-37.0	99% coating intact	Routine	
LWW	3E	Steel	MDL	-40.0	Minor coating failure. Good measurement 0.740"(2017)	UW	
LWW	3F	Steel	ITZ - MDL	-42.0	99% coating intact	Routine	
RWW	1B	Steel	MDL	-48.0	1' band of coating failure.	UW	
RWW	1C	Steel	ITZ - MDL		6" band of coating failure.	UW	
RWW	1D	Steel	MDL	-46.0	6" band of coating failure. Bad measurement 0.640" good 0.755" (2017)	Routine	
RWW	2A	Steel	ITZ - MDL		99% coating intact	Routine	
RWW	2B	Steel	Near MDL		Numerous 1-1/2" diameter areas of coating failure with pits up to 3/8" deep. Good measurement 0.725" (2017).	UW	
RWW	2C	Steel	ITZ - MDL		99% coating intact	Routine	
RWW	2D	Steel	ITZ - MDL		99% coating intact	Routine	
RWW	2E	Steel	ITZ - MDL	-44.0	99% coating intact	Routine	
RWW	3A	Steel	ITZ - MDL	-37.0	99% coating intact	Routine	
RWW	3B	Steel	ITZ - MDL		99% coating intact	Routine	
RWW	3C	Steel	ITZ - MDL	-40.0	99% coating intact	Routine	
RWW	3D	Steel	ITZ - MDL MDL	-38.0	99% coating intact 0.745"(2017)	Routine	
RWW	3E	Steel	ITZ - MDL		99% coating intact	Routine	

